What is claimed is:

1. A flash CVD process carried out in a reaction chamber, said flash CVD process comprising:

admitting one or more source precursor gases into the reaction chamber;

heating a substrate to a temperature greater than or equal to a decomposition temperature of the one or more source precursor gases, over a period of time ranging from 3 seconds to 300 seconds; and

contacting the substrate with the one or more source precursor gases;

whereby the one or more source precursor gases is decomposed on the substrate.

2. A flash CVD process according to claim 1, additionally comprising, after conclusion of the period of time, cooling the substrate to a temperature lower than the decomposition temperature of one or more source precursor gases.

3. A flash CVD process according to claim 2, wherein the substrate is cooled over a period of time ranging from 3 seconds to 300 seconds.

4. A flash CVD process according to claim 2, wherein the step of cooling the substrate is performed while contact of the substrate with the precursor is maintained.

5. A flash CVD process according to claim 2, wherein the steps are performed repeatedly in sequence.

6. A flash CVD process according to claim 1, wherein the substrate comprises graphite.

7. A flash CVD process according to claim 1, wherein the substrate is heated to a temperature ranging from 900°C to 2500°C.

8. A flash CVD process according to claim 7, wherein the substrate is heated to a temperature ranging from 1050°C to 1800°C.

9. A flash CVD process according to claim 8, wherein the substrate is heated to a temperature ranging from 1250°C to 1800°C.

10. A flash CVD process according to claim 1, wherein the substrate is heated over a period of time ranging from 10 seconds to 100 seconds.

11. A flash CVD process according to claim 1, wherein the substrate is heated over a period of time ranging from 20 seconds to 30 seconds.

12. A flash CVD process according to claim 1, wherein the substrate is resistively heated.

13. A flash CVD process according to claim 1, wherein the period of time is about 30 seconds.

14. A flash CVD process according to claim 1, additionally comprising admitting a carrier gas into the reaction chamber.

15. A flash CVD process according to claim 14, wherein the carrier gas comprises helium.

16. A flash CVD process according to claim 1, wherein the one or more source precursor gases comprises methane.

17. A flash CVD process according to claim 16, wherein the one or more source precursor gases comprises methane and the carrier gas comprises helium.

18. A flash CVD process according to claim 17, wherein ratio of methane to helium ranges from 0.5 to 27.5.

19. A flash CVD process according to claim 18, wherein the ratio of methane to helium ranges from 0.5 to 10.

20. A flash CVD process according to claim 19, wherein ratio of methane to helium ranges from 0.5 to 2.75.

21. A flash CVD process carried out in a reaction chamber, said flash CVD process comprising rapid transition from a first value of one or more process parameters to a second value of said one or more process parameters over a period of time ranging from 3 seconds to 300 seconds, said one or more process parameters comprising substrate temperature, reaction chamber gas composition, reaction chamber pressure, gas flow rate, applied electric field strength, and applied magnetic field strength, with the proviso that the one or more process parameters does not solely comprise reaction chamber gas composition; and

wherein the substrate is heated to a temperature greater than or equal to a decomposition temperature of the one or more source precursor gases.

22. A flash CVD process according to claim 1, wherein said one or more process parameters is substrate temperature.

23. A flash CVD process according to claim 23, wherein said one or more process parameters is substrate temperature and one or more selected from the group consisting of reaction chamber pressure, gas flow rate, applied electric field strength, and applied magnetic field strength.

24. A particle comprising a base having a shape of an inverted truncated right circular cone, wherein diameter of the inverted truncated right circular cone ranges from 1 nm to 100 microns and height of the inverted truncated right circular cone ranges from 5 nm to 1000 microns.

25. A particle according to claim 24, wherein the diameter ranges from 10 nm to 10 microns.

26. A particle according to claim 25, wherein the diameter ranges from 100 nm to 1 micron.

27. A particle according to claim 26, wherein height of the inverted truncated right circular cone ranges from 50 nm to 1000 microns.

28. A particle according to claim 27, wherein height of the inverted truncated right circular cone ranges from 5 nm to 1000 microns.

29. A particle according to claim 24, additionally comprising an at least partly semispherical head disposed atop the base.

30. A particle according to claim 24, additionally comprising a layered internal structure.

31. A particle according to claim 24, wherein said base is at least partly hollow.

32. A particle according to claim 24, comprising a material capable of forming one of a planar array, a two-dimensional lattice, or a nanotube.

33. A particle according to claim 32, wherein said material comprises carbon, hexagonal BN; B_xC_y, where x and y are independently 0, 1, 2, 3 or 4; $B_xC_yN_z$ where x, y and z are independently 0, 1, 2, 3 or 4; a dichalcogenide; a metal oxide; a metal boride; or a combination thereof.

34. A particle according to claim 33, comprising carbon.

35. A powder comprising particles having a shape of an inverted truncated right circular cone with a rounded top, wherein diameter of the cone ranges from 1 nm to 100 microns and height of the cone ranges from 5 nm to 1000 microns.

36. A powder according to claim 34, wherein the diameter ranges from 10 nm to 10 microns.

37. A powder according to claim 35, wherein the diameter ranges from 100 nm to 1 micron.

38. A powder according to claim 34, additionally comprising a layered internal structure.

39. A powder according to claim 34, wherein said particles are at least partly hollow.

40. A powder according to claim 34, comprising carbon, hexagonal BN; B_xC_y, where x and y are independently 0, 1, 2, 3 or 4; $B_xC_yN_z$ where x, y and z are independently 0, 1, 2, 3 or 4; a dichalcogenide; a metal oxide; a metal boride; or a combination thereof.

41. A powder according to claim 40, comprising MoS_2, WS_2, V_2O_5, MoO_3, MgB_2 or a combination thereof.

42. A particle according to claim 34, comprising MoS_2, WS_2, V_2O_5, MoO_3, MgB_2 or a combination thereof.